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The spitting spider family Scytodidae in Thailand, with descriptions of three new *Dictis* species (Araneae)

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The spitting spider family Scytodidae in Thailand, with descriptions of three new *Dictis* species (Araneae). - Nine spider species belonging to the genus *Dictis* L. Koch and presumably to the genus *Scytodes* Latreille were collected from forests of Thailand. Three of them are new (*Dictis elongata* sp. n., *D. denticulata* sp. n., and *D. thailandica* sp. n.), two are known species for which morphological variation and extended geographic ranges are recorded (*Scytodes fusca* and *S. mawphlongensis*), and a further four species known only from one sex are illustrated and provisionally described using open nomenclature (three *Dictis* and one *Scytodes* species).

Keywords: Southeast Asia - zoogeography - biodiversity - new record.

INTRODUCTION

This paper deals with scytodid species collected in Thailand that have not previously been documented. It is the first in a series on faunistic and taxonomic studies on the Southeast Asian spitting spiders preserved and maintained in the collection of the Muséum d'histoire naturelle de la Ville de Genève, Switzerland (MHNG).

Several scytodid species were recognized and illustrated from South and Southeast Asia, including *Dictis striatipes* L. Koch, 1872 (China to Australia), *Scytodes thoracica* (Latreille, 1802) (China, Korea, Japan), *S. mawphlongensis* Tikader, 1966 (Nepal and India), *S. univittata* Simon, 1882 (Burma and India), *S. venusta* (Thorell, 1890) (Sri Lanka to Java), *S. magna* Bristowe, 1952, *S. cavernarum* Roewer, 1962 and *S. lugubris* (Thorell, 1887) (Malaysia), *S. pallida* Doleschall, 1859 (India, China, and southwards to New Guinea). *Scytodes gilva* (Thorell, 1887) (Burma and India) was originally described in the genus *Dictis* L. Koch. *Scytodes stoliczkai* Simon, 1897 (India) is known from the female type only. *Scytodes grammocephala* Simon, 1909 was recorded from Vietnam and no further information has become available since its original description. Brignoli (1976) provided an insightful introduction to the taxonomy of the family Scytodidae with a critical review of the species known at that time. Lehtinen (1986) subsequently published a perspective view on the evolution of the superfamily Scytodoidea and provided illustrations of some widespread species which are also known to occur in this region. These taxa are *S. fusca* Walckenaer,

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1837 (pantropical), *S. longipes* Lucas, 1844 (pantropical) and *S. magna* (Malaysia). Lately, Deeleman-Reinhold (1989) gave the description and illustrations of an unnamed *Scytodes* species from Borneo. More recently, Ono (1995) established the genus *Stedocys* to accommodate peculiar scytodid species with extremely elongated legs and primitive palpal morphology from Thailand and Malaysia. No further taxonomic publications on Southeast Asian *Scytodes* were produced since then.

Four groups are recognized on the basis of female genital morphology. Members of group A (*Dictis* spp.) possess a typical paired vulva, each side consisting of three main parts (Figs 1-12, 16, 22, 24, 26): (1) the sclerotized funnel-shaped introductory atrium (A, Fig. 24), (2) the stalked receptaculum (R, Figs 24, 26-37), and (3) the digitiform posterior pouch (P, Fig. 24). Group B currently consists of only two species (*D. thailandica* sp. n. and an undescribed species from Malaysia) that closely resemble those of group C in which the posterior pouch is absent and the introductory atrium is entirely membranous (Figs 28-30). The atrium is represented by an inflated sac-like bursa. Group C accommodates only a single species, *S. mawphlongensis*, which has a peculiar genital modification (Figs 27, 34-35): both introductory atria being entirely membranous and medially fused with each other; the posterior pouch is absent. The female genitalia of group D (*S. fusca* and an unnamed species from Sarawak) exhibit an extreme modification in which the receptaculum is represented by a slender, thick-walled, heavily perforated tubular stalk with a small, membranous head (Figs 31-33). The posterior pouch is also absent and the introductory atrium is greatly reduced. The shape of the ventral scutulae (situated posterior to the epigastric furrow) is not taken into account because it is of minor taxonomic value and varies greatly among members of the same species or even on both sides the same individual (Fig. 1).

The bristles situated in the female genital region are usually elongate and slender. This is not the case in *S. fusca* where the bristles are feather-like and provided with minute branches along their entire length (Fig. 56). The modified bristles of *S. mawphlongensis* are further developed; they have numerous branches basally, whereas the apical portion is unusually elongate and looks like a spigot (Figs 57-58). As another form of modification, club-shaped bristles (Figs 53-54) can be found on the dorsum of the opisthosoma in males collected in southern Thailand (*Scytodes* sp. A). The modification of these bristles is of interest but its taxonomic value cannot be established at this stage.

These differences found among species currently placed in *Scytodes* suggest that the taxon is paraphyletic and needs to be divided into several monophyletic clades. Faunistic and biological information on these spiders is still incomplete.

MATERIAL AND METHODS

External morphology was examined, measured and drawn with an Olympus SZX-9 stereomicroscope and an Olympus BX-40 equipped with a drawing tube and photographic devices. Measurements of leg segments were taken from the dorsal side. All measurements are in millimetres; leg measurements are given in the following order: total (femur, patella, tibia, metatarsus, tarsus). Female genitalia were drawn in

natural and cleared state (after immersing in 90% lactic acid for 10-20 minutes). Illustrations are of specimens from Thailand, unless otherwise indicated. Type specimens will be deposited in the collections of the Muséum d'histoire naturelle de la Ville de Genève, Switzerland (MHNG) and of the Thailand Natural History Museum, National Science Museum, Pathumthani Province, Thailand (TNHM).

Abbreviations used in the text and in the figures are as follows: A, introductory atrium of vulva; GP, glandular pore; P, posterior pouch of vulva; RH, head of receptaculum; RS, stalk of receptaculum.

In the text 'Fig.' and "Figs" refer to figures herein, while 'fig.' and "figs" refer to figures published elsewhere.

TAXONOMY

Family **Scytodidae** Blackwall, 1864

REMARKS: Some confusion exists concerning the classification of *Scytodes* which was originally established by Latreille in 1804. The genus *Scytodes* has caused taxonomic problems and misinterpretations since its introduction over two hundred years ago. It has long been an expedient depository for those scytodids that do not exhibit any remarkable divergent characters. *Scytodes thoracica* (Latreille, 1802), the type species of the type genus of the family Scytodidae, has been more often misidentified than correctly identified during the history of arachnology (Lehtinen, personal communication). Numerous publications on scytodids were not based on a comparison of types but on an interpretation of the taxa concerned. These errors were perpetuated by many subsequent authors. Furthermore, subadult females with sclerotized pre-epigyna have been mistaken for adults, which consequently resulted in the creation of synonyms. Scytodidae is one of the moderately diversified spider families which has never been revised. Placement of the Thai scytodids treated in the present study is provisional pending a generic revision of the family Scytodidae. P. Lehtinen and the first author (PD) intend to divide the subfamily Scytodinae into two main groups: those genera with three tarsal claws on their legs, including the genus *Scytodes* and related new genera, and those with only two tarsal claws, represented by the genus *Dictis*.

Group A

SPECIES INCLUDED: *Dictis elongata* sp. n., *D. denticulata* sp. n., *Dictis* sp. A, *Dictis* sp. B, *Dictis* sp. C.

Genus ***Dictis*** L. Koch, 1872

TYPE SPECIES: *Dictis striatipes* L. Koch, 1872, by original designation and monotypy.

REMARKS: The genus *Dictis* was until now monotypic, containing only one species, *D. striatipes* L. Koch, 1872, known from northeastern China to the Easter Islands and New Caledonia. Members of the genus *Dictis* possess two tarsal claws on their legs, whereas *Scytodes* has three. *Dictis* sensu L. Koch includes several lineages

which need to be separated into genera. Currently the presence of only two tarsal claws is the main diagnostic character for this genus. L. Koch (1872: 294-296) provided a detailed description of these claws: one is stated to have a single row of teeth, the other provided with two rows of teeth. This feature was especially mentioned in relation to *Loxosceles* Heineken & Lowe (now in Sicariidae), as L. Koch believed that *Dictis* is some kind of "transition" between *Loxosceles* and *Scytodes*. F.O.P.-Cambridge (1899: 48) stated that *Loxosceles* 'resembles *Scytodes* in the possession of a tarsal onychium and of a similarly constructed stridulating-apparatus'. However, this pattern of dentate claws also presents in a number of scytodid species which cannot be placed in *Dictis* (Lehtinen, personal communication). Unfortunately, the considerable variability of female and male genital organs was not discussed in the original description of the genus given by L. Koch.

The genus *Dictis* was removed from the synonymy of *Scytodes* by Saaristo (1997: 56). He did not give an emended diagnosis for *Dictis*, but provided an extensive discussion about the state of taxonomy in Scytodidae and placed most scytodids from the Seychelles in the genus *Scytodes*. Although Saaristo (1997: 56) mentioned in his diagnoses of the Seychellian *Dictis* species the presence of 'slightly dentate ridges on tarsal claws', this character is not diagnostic for the genus *Dictis*, but only to some, possibly not related species (Lehtinen, personal communication). The scytodid species with two tarsal claws treated in the present study are tentatively placed in *Dictis* pending a suprageneric revision of the family Scytodidae.

Dictis elongata sp. n. Figs 5, 11, 13-16, 46, 51

HOLOTYPE: ♂, Northeastern Thailand, Loei Province, Phu Ruea National Park, park headquarters (17°28.83'N, 101°21.33'E), 860 m, sifting, 5-8.vii.2006, leg. P. Dankittipakul [MHNG].

PARATYPES: Same data as for holotype, 2♂ [TNHM]. – Sakon Nakhon Province, Phu Pha Yon National Park, deciduous dipterocarp forest (16°55.45'N, 104°10.76'E), 300 m, 1♀, Malaise trap, 17-23.vii.2006, leg. P. Dankittipakul [MHNG]: ibidem, 2♀, 23-29.vii.2006 [MHNG, TNHM].

ETYMOLOGY: The specific epithet refers to the extraordinarily elongated embolic part of the male palpal organ.

DIAGNOSIS: Males of *D. elongata* sp. n. are recognized by the male bulb, which is basally ovoid and provided with an unusually elongated, curved embolus (Figs 15, 46). Males are somewhat similar to those of *S. venusta* (*S. venusta* actually belongs to *Dictis* and will be formally transferred in a separate paper) in possessing a lengthened, aciculate embolus curving ventrad, but in *D. elongata* sp. n. the embolus is gradually narrowing towards the apex, whereas *in S. venusta* the margins are more or less parallel. Males can be distinguished from those of *S. fusca* by the distinctly elongate embolus tipped by a translucent terminal flange (Figs 14, 51) instead of a semicircular subterminal ridge. Females of *D. elongata* sp. n. can be recognized by the rather simple internal structure of the vulva and the digitiform posterior pouch which is large and directed anteriad (Figs 5, 11, 16). They can be distinguished from those of the closely related *D. denticulata* sp. n. by the posterior pouch being larger, extending beyond the heavily sclerotized introductory atrium.

DESCRIPTION:

Male (holotype): Prosoma 4.1 long, 3.3 wide. Leg measurements: I 16.0 (4.8, 0.8, 4.6, 4.6, 1.2), II 13.3 (3.8, 0.8. 3.7, 3.8, 1.2), III 12.9 (3.1, 0.8, 4.0, 3.9, 1.1), IV 13.9 (4.3, 0.8, 3.8, 3.8, 1.2).

Pattern and coloration (Fig. 13). Prosoma strongly convex, in profile highest in the middle, slightly longer than wide. Opisthosoma elongate ovoid, clothed with fine bristles. Carapace yellowish, provided with dark purplish pattern: thin median band extending over approximately ¾ length of prosoma, laterally with paired elongate U-shaped bands extending further behind; marginally with two thin bands encircling the prosoma. Dorsum of opisthosoma yellowish, posteriorly with a series of 5 narrow, medially disconnected bands running transversely, anteriorly with a short, slender band running medio-longitudinally over cardiac region. Legs yellowish; femora and tibiae with purplish brown longitudinal bands situated prolaterally, other leg segments with irregular color pattern.

Male palp (Figs 14-15, 46, 51). Palpal femora cylindrical, anteromedially with a small, sclerotized apophysis with blunt apex. Cymbium with two spiniform distal setae. Bulb ovoid; embolic part long and strongly curved, gradually narrowing towards its apex, directing ventrad, approximately 2 times longer than basal part, apically with translucent ridge.

Female (paratype from Sakon Nakhon Province): Prosoma 3.9 long, 3.0 wide. Leg measurements: I 15.4 (4.6, 0.8, 4.4, 4.5, 1.1), II 12.6 (3.5, 0.8. 3.6, 3.7, 1.0), III 12.4 (2.9, 0.8, 3.9, 3.8, 1.0), IV 13.5 (4.1, 0.8, 3.7, 3.8, 1.1).

Pattern and coloration. Prosoma strongly convex, in profile highest in the middle, slightly longer than wide. Opisthosoma elongate ovoid. Carapace yellowish, provided with a thin median band extending over approximately ¾ length of prosoma, laterally with paired elongate U-shaped bands extending further behind; marginally with two thin bands encircling the prosoma. Dorsum of opisthosoma yellowish, posteriorly with a series of narrow, medially disconnected bands running transversely, anteriorly with a short band running medio-longitudinally over cardiac region, surrounded by irregularly arranged purplish lines. Legs yellowish; femora and tibiae with purplish brown prolateral longitudinal bands, other leg segments pale, with irregular color pattern.

Female genitalia (Figs 5, 11, 16). Epigastric furrow slightly excavated medially, lightly sclerotized basolaterally, internally membranous, with large glandular pores. Atrium funnel-shaped, proximal part narrowed, with membranous wall, the rest heavily sclerotized, glandular pores situated anteriorly. Posterior pouch digitiform, relatively broad, slightly bent anteriad. Receptaculum with stalk elongated, tubular, thick-walled, slightly enlarged posteriorly; glandular pores presented on receptacular head.

NATURAL HISTORY: *Dictis elongata* sp. n. inhabits deciduous dipterocarp forests with a relatively sparse canopy.

DISTRIBUTION: Known from two localities in northeastern Thailand.

Dictis denticulata sp. n. Figs 1, 3, 9, 17-20, 47, 50, 52

HOLOTYPE: ♂, Northeastern Thailand, Chaiyaphum Province, Tad Tone National Park, dry dipterocarp forest (15°59.037'N, 102°2.103'E), 250 m, 26.ix.2006 [MHNG].

PARATYPES: Tad Tone National Park, forest behind park headquarters (15°58.538'N 102°02.153'E), 280 m: 1♂, 2♀, pan trap, 10.-11.vii.2006 [MHNG]; ibidem, 1♂, pan trap, 5.-8.xi.2006 [MHNG]; ibidem, 1♀, Malaise trap, 19-26.vii.2006. – Loei Province, Phu Ruea National Park, park headquarters (17°28.826'N, 101°21.330'E), 860 m, 1♂, pan traps, 5.-6.vii.2006 [MHNG]. – Loei Province, Phu Kradueng National Park, Koke Hin Ngam (16°51.817'N, 101°50.704'E), 270 m, 1♀, pan traps, 13.-14.viii.2006 [MHNG]. – Khonkaen Province, Nam Pong National Park, office (16°37.341'N, 102°34.467'E), 324 m, 1♂, Malaise traps 19.-26.vii.2006. – Chaiyaphum Province, Pa Hin Ngam National Park, Siamese tulip field (15°38.438'N, 101°23.576'E), 780 m, 1♂, pan trap, 7.-8.vii.2006 [MHNG]. – Sakon Nakhon Province, Phu Phan National Park, Huay Wien Prai Forest Unit (17°06.810'N, 104°00.318'E), 318 m: 1♂, 1♀, Malaise trap, 21.-27.viii.2006 [TNHM]; 2♀, Malaise trap 15.-30.ix.2006 [TNHM]; 2♀, Malaise trap, 21.-27.viii.2006 [TNHM]; park headquarters (17°03.521'N, 103°58.450'E), 320 m, 1♀, pan trap, 7.viii-9.vii.2006 [TNHM]. – Sakon Nakhon Province, Phu Pha Yon National Park, reservoir (16°55.655'N, 104°10.658'E), 280 m: 1♀, Malaise trap, 23.-29.vii.2006 [MHNG]; deciduous dipterocarp forest (16°55.449'N, 104°10.757'E), 295 m: 1♀, Malaise trap, 23.-29.vii.2006 [MHNG]; 1♀, Malaise trap 17.-23.vii.2006 [MHNG]. – Ubon Ratchathani Province, Pha Taem National Park (15°24.304'N, 105°31.258'E), 230 m: 1♂, Malaise trap, 5.-12.viii.2006 [MHNG]; 1♀, Malaise trap, 5.-20.ix.2006 [MHNG]; 1♀, Malaise trap, 15.viii.2006 [MHNG]. All leg. P. Dankittipakul.

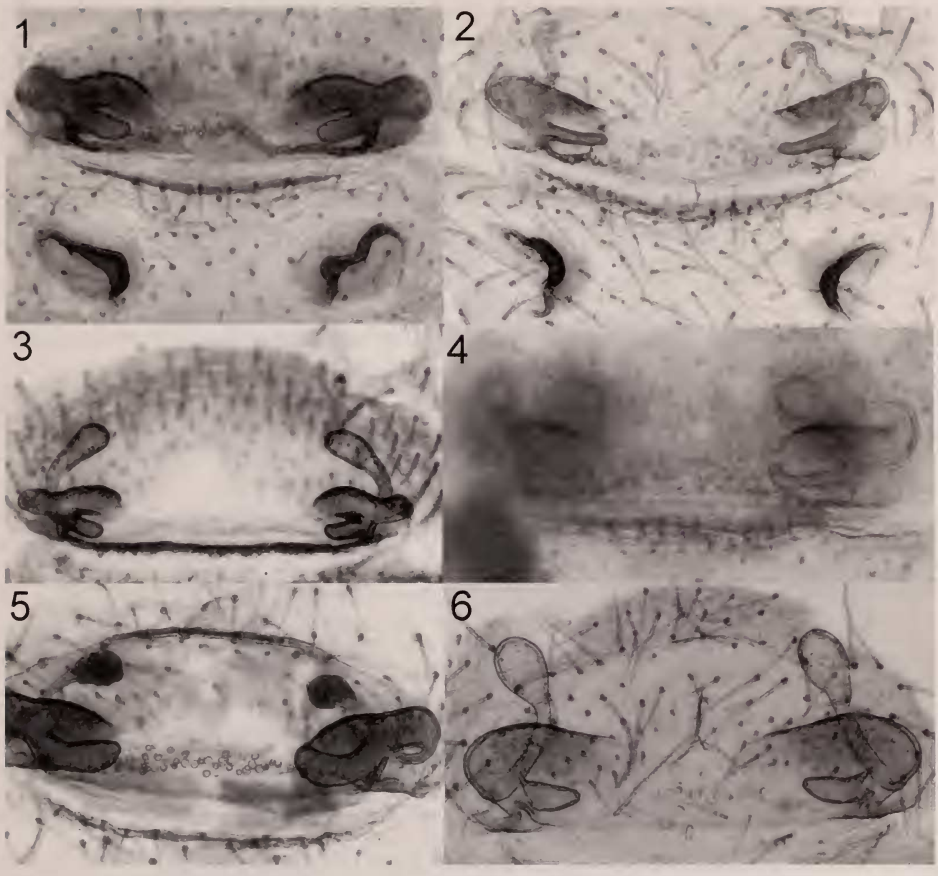
ETYMOLOGY: The specific epithet refers to the presence of a row of denticles situated proventrally on tibia I of males.

DIAGNOSIS: *Dictis denticulata* sp. n. stands out among 189 known scytodid species as being one of the few that have a subapical spike on the male bulb. Males of *D. denticulata* sp. n. are recognized by the presence of a slender subapical spike in combination with a subterminal ridge on the embolus (Figs 19, 50) and by a row of triangular ventral denticles on tibia I (Fig. 52). The male palpal morphology of *D. denticulata* sp. n. is very similar to that of *S. lugubris* (*S. lugubris* actually belongs to *Dictis* and will be formally transferred in a separate paper). Males of this new species can be easily distinguished from those of *S. univittata* Simon, 1882 (South Yemen to Burma, St. Helena) (Lehtinen, personal communication) by their abruptly bent embolic tip, by the absence of a translucent membranous flange, and by one of the enlarged setae on the apex of the cymbium being short and conical (elongated and slender in *S. univittata*). Apart from being distinctly smaller in body size, females of this new species can be distinguished from those of the closely related *D. elongata* sp. n. by the digitiform posterior pouch being much shorter and bent posteroventrad (Figs 3, 9) instead of anteriad (Figs 5, 11), and the glandular pores are restricted to the proximal part of the introductory atrium (Fig. 20).

DESCRIPTION:

Male (holotype): Prosoma 4.2 long, 3.4 wide. Leg measurements: I 16.6 (4.9, 1.0, 4.7, 4.8, 1.2), II 13.7 (3.8, 1.0. 3.8, 3.9, 1.2), III 13.2 (3.2, 1.0, 4.0, 3.9, 1.1), IV 14.8 (4.5, 1.0, 4.0, 4.1, 1.2).

Pattern and coloration (Fig. 17). Prosoma strongly convex, in profile highest posteriorly. Opisthosoma globular, clothed with fine bristles. Carapace yellowish, provided with dark brownish pattern: thin median band running longitudinally, laterally with a pair of broader bands extending over approximately ¾ length of



FIGS 1-6

(1, 3) *Dictis denticulata* sp. n., paratypes. (2) *Dictis* sp. A. (4) *Dictis* sp. B. (5) *D. elongata* sp. n., paratype. (6) *Dictis* sp. C. Internal genitalia of females, dorsal view.

prosoma; marginally with a broad irregular band encircling the prosoma. Dorsum of opisthosoma yellowish, anteriorly with a broad dark brownish band, followed by three transverse chevrons. Legs yellowish; femora and tibiae with numerous purplish brown spots and stripes, other leg segments with irregular color pattern, mostly pale. Tibiae I with row of triangular denticles situated proventrally (Fig. 52).

Male palp (Figs 18-19, 47, 50). Palpal femur cylindrical, anteromedially with a small, sclerotized apophysis with blunt apex. Cymbium with two enlarged distal setae: a very thick, conical one situated apically and a thinner, more elongate subapical one. Bulb elongate pear-shaped, long margins of embolic part almost parallel proximally, gradually narrowing towards its apex, provided with a slender cylindrical spike branching subapically, main embolic part bent behind it.

Female (paratype from the type locality): Prosoma 4.0 long, 3.1 wide. Leg measurements: I 16.1 (4.8, 0.9, 4.6, 4.7, 1.1), II 13.1 (3.6, 0.8. 3.8, 3.9, 1.0), III 12.8 (3.0, 0.9, 4.0, 3.9, 1.0), IV 14.3 (4.3, 0.9, 4.0, 4.0, 1.1).

Pattern and coloration. General morphology as in males but carapace with faint brownish pattern; legs furnished with numerous round purplish spots, rarely with stripes.

Female genitalia (Figs 3, 9, 20). Epigastric furrow slightly excavated medially, lightly sclerotized basolaterally, heavily sclerotized internally, with glandular pores. Atrium funnel-shaped, proximal part narrowed, with membranous wall, distinctly separate from the heavily sclerotized rest, glandular pores restricted to proximal part. Posterior pouch digitiform. Receptacular stalk thick-walled, slightly enlarged posteriorly, glandular pores presented in elongate receptacular head.

NATURAL HISTORY: *Dictis denticulata* sp. n. inhabits deciduous dipterocarp forests of northeastern Thailand. Specimens of both sexes were mainly collected by means of Malaise traps, suggesting that they are active hunters, roaming freely on the forest floors.

DISTRIBUTION: Known from several localities in northeastern Thailand.

***Dictis* sp. A** Figs 2, 8, 21-22

MATERIAL EXAMINED: Northern Thailand, Chiang Mai Province, Chomthong District, Doi Inthanon National Park, Doi Inthanon, 510 m, dipterocarp forest, sifting, 1♀, 25.ii.1999, leg. P. Dankittipakul [MHNG]. – Nan Province, Khun Nan National Park, 750 m, sifting, 1♀, 8.xii.2005, leg. P. Dankittipakul [MHNG].

TAXONOMIC REMARKS: This species can be easily distinguished from other *Dictis* known to occur in Thailand by the digitiform posterior pouch of the vulva being slender and with parallel margins (Figs 2, 8, 22). This species is not named here because its male is unknown.

DESCRIPTION:

Female: Pattern and coloration (Fig. 21). Prosoma pear-shaped, strongly convex posteriorly. Carapace yellowish, provided with brownish markings. Opisthosoma globular, yellowish, dorsum provided with a series of transverse dark brown bands. Legs pale yellow, femora prolaterally with broken purplish markings along the entire length, tibiae and metatarsi with dark purplish annuli on proximal and distal parts, and with numerous purplish spots in between them.

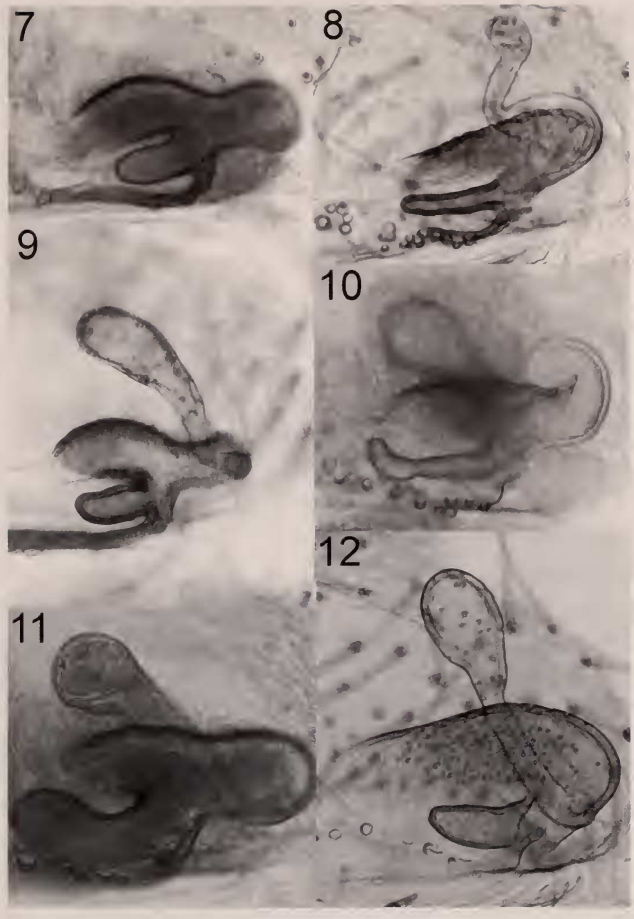
Female genitalia (Figs 2, 8, 22). Epigastric furrow slightly protruding medially, lightly sclerotized, with glandular pores. Atrium funnel-shaped, proximal part with membranous wall, the rest sclerotized, with glandular pores situated anteriorly. Posterior pouch digitiform, lateral margins parallel. Receptaculum thick-walled, distinctly enlarged posteriorly, forming slender stalk anteriorly, glandular pores present.

NATURAL HISTORY: The specimens were obtained by sifting litter in deciduous dipterocarp and mixed deciduous forests.

DISTRIBUTION: Known from two localities in northern Thailand.

***Dictis* sp. B** Figs 4, 10, 23-24

MATERIAL EXAMINED: Northern Thailand, Chiang Mai Province, Chomthong District, Doi Inthanon National Park, Doi Inthanon, 510 m, dipterocarp forests, 3♀, pitfall trap, 25.iii.-28.iv.1999, leg. P. Dankittipakul [MHNG].



FIGS 7-12

(7, 9) *Dictis denticulata* sp. n., paratype. (11) *D. elongata* sp. n., paratype. (8) *Dictis* sp. A. (10) *Dictis* sp. B. (12) *Dictis* sp. C. Details of right internal genitalia of females, dorsal view.

REMARKS: The female of this species is similar to that of *Dictis* sp. A in possessing an elongate and slender posterior vulval pouch with parallel margins. *Dictis* sp. B can be distinguished from *Dictis* sp. A by the modified posterior pouch which is constricted subapically, and by the anterior margin of the introductory atrium which is highly convex instead of straight (Figs 4, 10, 24). This species is not given a formal species name because its male is unknown.

DESCRIPTION:

Female: Pattern and coloration (Fig. 23). Prosoma strongly convex posteriorly. Carapace pale yellowish, with faint brownish markings. Opisthosoma globular, dorsum pale yellowish, anteriorly with broad transverse brownish band followed by a series of thinner chevrons.

Female genitalia (Figs 4, 10, 24). Epigastric furrow slightly protruding medially, entirely membranous, with glandular pores. Atrium funnel-shaped, proximal

part with membranous wall, the rest sclerotized, glandular pores indistinct. Posterior pouch digitiform, lateral margins parallel, distinctly constricted subapically. Receptaculum thick-walled, enlarged and swollen posteriorly, forming slender stalk anteriorly, glandular pores indistinct.

NATURAL HISTORY: The specimens were obtained by pitfall trapping in a deciduous dipterocarp forest.

DISTRIBUTION: Known from one locality in northern Thailand.

***Dictis* sp. C** Figs 6, 12, 25-26, 36-37

MATERIAL EXAMINED: Northern Thailand, Chiang Mai Province and District, Doi Suthep-Pui National Park, near Monthatharn Waterfall, sifting, 5♀, 25.vii.1999, leg. P. Dankittipakul [MHNG].

REMARKS: The female of this species can be easily recognized by the following characters: the atrium of the vulva is heavily sclerotized and provided with numerous glandular pores (Figs 26, 37); the receptaculum is represented by an elongate slender stalk (Figs 12, 26). This species is not named because its male is unknown.

DESCRIPTION

Female: Prosoma strongly convex posteriorly. Carapace pale yellowish, with faint brownish markings. Opisthosoma ovoid, dorsum pale yellowish, anteriorly with broad transverse brownish band followed by a series of thinner chevrons.

Female genitalia (Figs 6, 12, 26, 36-37). Epigastric furrow slightly excavated medially, slightly sclerotized, with glandular pores. Atrium funnel-shaped, proximal part with membranous wall, the rest heavily sclerotized, provided with numerous glandular pores. Posterior pouch digitiform, relatively robust. Receptaculum thick walled, with slender tubular stalk, glandular pores numerous.

NATURAL HISTORY: The specimens were obtained by means of sifting dead leaves and decomposing organic matter in a mixed deciduous forest.

DISTRIBUTION: Known from one locality in northern Thailand.

Group B

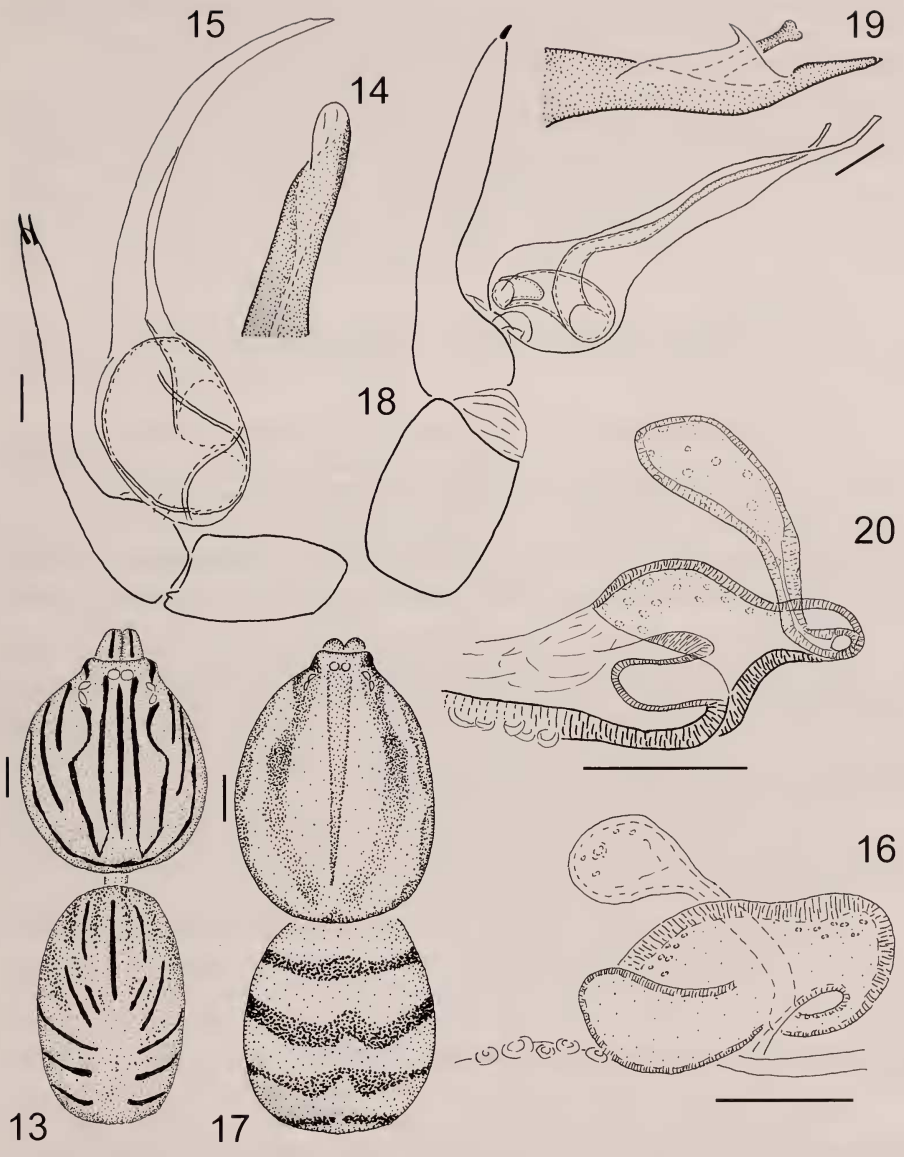
SPECIES INCLUDED: *Dictis thailandica* sp. n. and an undescribed *Dictis* species from Malaysia (see Brignoli 1976: 159, figs 56-57)

Dictis thailandica sp. n. Figs 28-30, 38-41, 48-49

HOLOTYPE: ♂, Southern Thailand, Nakhorn Sri Thammarat Province, Khao Nan National Park, 25.ii.2006, leg. P. Dankittipakul [MHNG].

PARATYPES: Same data as for holotype, 2♂, 2♀ [MHNG, TNHM]. – Khonkaen Province, Nam Pong National Park, forest near park headquarters (16°37.341'N, 102°34.467'E), 325 m, 1♀, Malaise trap, 19.-26.vii.2006, leg. P. Dankittipakul [MHNG].

ETYMOLOGY: The specific epithet is a Latin adjective of the name 'Thailand'.



FIGS 13-20

(13-16) *Dictis elongata* sp. n., holotype (13-15) and paratype (16). (17-19, 20) *Dictis denticulata* sp. n., holotype (17-19) and paratype (20). (13, 17) Habitus of male, dorsal view. (14, 19) Tip of embolus. (15, 18) Male palp, lateral view. (16, 20) Right part of internal genitalia, dorsal view. Scale lines: 0.25 mm (13, 17), 0.10 mm (15, 18), 0.05 mm (14, 16, 19, 20).

DIAGNOSIS: Males of *D. thailandica* sp. n. are easily recognized by the globular base of the male palpal organ, in combination with a funnel-shaped embolus which is gradually narrowing, and with a slender subapical embolic spike (Figs 39-40, 48-49).

Females can be distinguished by the rather simple vulva which consists of a large median bursa and a pair of anteriorly inflated receptacula with slender stalks (Figs 28-30). Females of this new species are very similar to those of Brignoli's *Scytodes* sp. B (Brignoli, 1976: 159, figs 56-57) from Malaysia (deposited in MHNG, examined) in which the membranous introductory atrium is enlarged, represented by a median bursa and two spherical receptacula situated far apart on the lateral sides. Females of *D. thailandica* sp. n. can be distinguished from the latter by the basal portion of the inflated receptacula being funnel-shaped and lightly sclerotized on its outer (ectal) surface (being entirely membranous and stalked in *Scytodes* sp. B of Brignoli).

DESCRIPTION

Male (holotype): Prosoma 4.0 long, 3.1 wide. Leg measurements: I 15.5 (4.7, 0.8, 4.5, 4.5, 1.0), II 13.0 (3.7, 0.8. 3.7, 3.8, 1.0), III 11.8 (3.0, 0.8, 3.1, 3.9, 1.0), IV 13.8 (4.2, 0.8, 3.8, 3.9, 1.1).

Pattern and coloration (Fig. 38). Prosoma strongly convex posteriorly. Carapace yellowish, with thin, usually disconnected bands of dark purplish color running longitudinally. Opisthosoma elongate oval; dorsum of opisthosoma yellowish; color pattern: median band running longitudinally over cardiac region; four short dark bands situated anteriorly; four longer and wider dark bands behind them; a broad transverse, medially broken band situated posteriorly. Legs elongate, slender, pale yellowish, without distinct marking.

Male palp (Figs 39-40, 48-49). Palpal femur cylindrical, slightly longer than wide, anteromedially with small, sclerotized apophysis ending in blunt apex. Cymbium with two spiniform distal setae. Bulb globular; embolic part funnel-shaped, moderately long, curved ventrad, gradually narrowing towards its cylindrical apex, subapically provided with sharply pointed needle-shaped process.

Female (paratype from the type locality): Prosoma 3.8 long, 3.0 wide. Leg measurements: I 15.1 (4.5, 0.8, 4.4, 4.4, 1.0), II 12.5 (3.5, 0.8. 3.5, 3.7, 1.0), III 12.3 (3.0, 0.8, 3.8, 3.7, 1.0), IV 13.4 (4.0, 0.8, 3.7, 3.8, 1.1).

Pattern and coloration. Prosoma strongly convex posteriorly. Carapace yellowish, with slender median band running longitudinally, accompanied by two elongated, U-shaped bands laterally. Opisthosoma elongate oval, widest at its half length, yellowish in color; pattern on dorsum of opisthosoma: short median band running longitudinally over cardiac region, surrounded by several rings of thin, disconnected bands. Legs pale yellow, femora dorsally with faint remnant of purplish band.

Female genitalia (Figs 28-30, 41). Epigastric furrow slightly protruding medially, lightly sclerotized, without glandular pores. Atrium large, represented by dilated median bursa, entirely membranous. Posterior pouch absent. Receptaculum spherical, basally forming short stalk, provided with numerous glandular pores.

NATURAL HISTORY: The holotype was collected by sifting dead leaves and decomposing organic litter in a lowland evergreen forest, whereas the female paratype collected in northeastern Thailand was obtained from a Malaise trap. This suggests that these spiders are roaming freely on the forest floor.

DISTRIBUTION: Known from two localities in northeastern and southern Thailand.

Genus ***Scytodes*** Latreille, 1804

TYPE SPECIES: *Scytodes thoracica* (Latreille, 1802).

REMARKS: *Scytodes* belongs to a group of several scytodid genera (most of which are undescribed) in which males have three tarsal claws on their legs and numerous modified spigots on the ventral surface (epigastric region) of the opisthosoma (Lehtinen & Dankittipakul, in preparation). Thus the scytodid species with three tarsal claws treated in this paper are considered as members of the genus *Scytodes*. However, this concept also includes well-known nominal *Scytodes* species which clearly differ from *Scytodes* sensu stricto and belong to undescribed genera. At this stage it has not been possible to confidently establish the generic affiliations for several species treated here. A suprageneric revision of the family Scytodidae by Lehtinen & Dankittipakul is pending.

Group C

SPECIES INCLUDED: *Scytodes mawphlongensis* Tikader, 1966.

Scytodes mawphlongensis Tikader, 1966 Figs 27, 34-35, 57-58

Scytodes mawphlongensis Tikader, 1966: 627, fig. 1a-d, description of ♂♀. – Tikader, 1969: 156, figs 9-12, illustration of ♂.

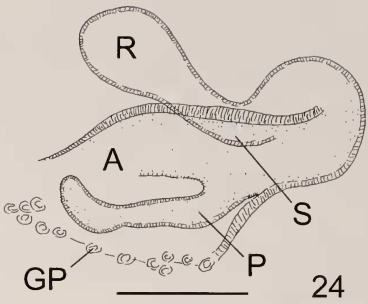
Scytodes cf. *strandi* Spassky, 1941. – Brignoli, 1976: 153, figs 36-48, illustration of ♂♀.

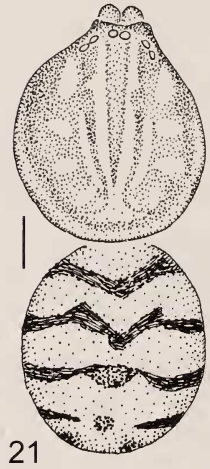
MATERIAL EXAMINED: 2♀, Northern Thailand, Chiang Mai Province, Chiang Dao District, Chiang Dao Wildlife Research Station, 380 m, sifting, 12.-16.vi.2002, leg. P. Dankittipakul [MHNG, TNHM].

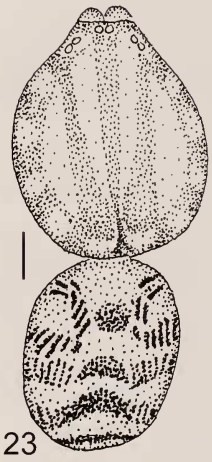
REMARKS: The females examined are tentatively identified as *S. mawphlongensis*. They are similar to the Nepalese specimens collected from Phulchoki (near Kathmandu) but can be distinguished from them by the epigastric furrow being membranous instead of strongly sclerotized and by the absence of glandular pores in the genital atrium, which are present in significant quantities in the Nepalese specimens. The intra-specific variation of *S. mawphlongensis* was first documented by Brignoli (1976) who indentified three different forms. No significant genitalic differences were detected among the females obtained from Thailand and those described by Tikader (1966, 1969) and Brignoli (1976). Much larger samples would be needed to corroborate these slight differences as species-specific rather than individual variation.

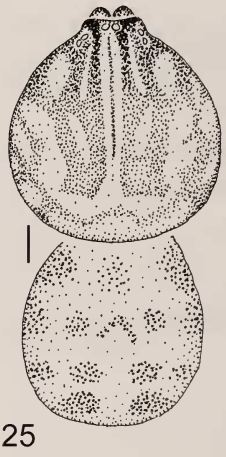
DESCRIPTION

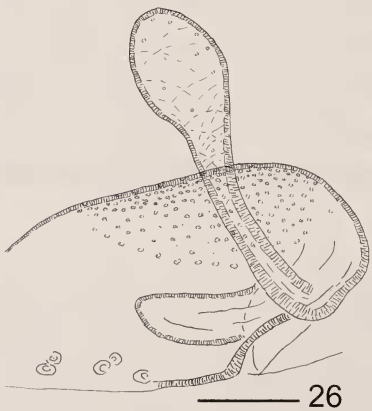
Female: Prosoma strongly convex, in profile highest in the middle, slightly longer than wide. Opisthosoma globular, clothed with fine bristles. Carapace yellowish, provided with dark brown pattern. Dorsum of opisthosoma yellowish, with a series of 5 large chevrons running transversely, first and second chevrons disconnected medially, the rest connected by thin median band. Legs yellowish; femora I-III with longitudinal purplish brown bands on dorsal and ventral sides, femora IV pale, with dark purplish annuli situated distally; patella with purplish proventral bands; tibiae and metatarsi dorsally with dark purplish longitudinal dorsal band; tarsi with faint purplish marking. Bristles in genital region spigot-like (Figs 57-58).

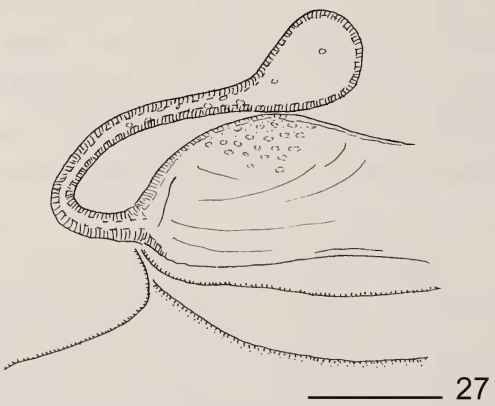






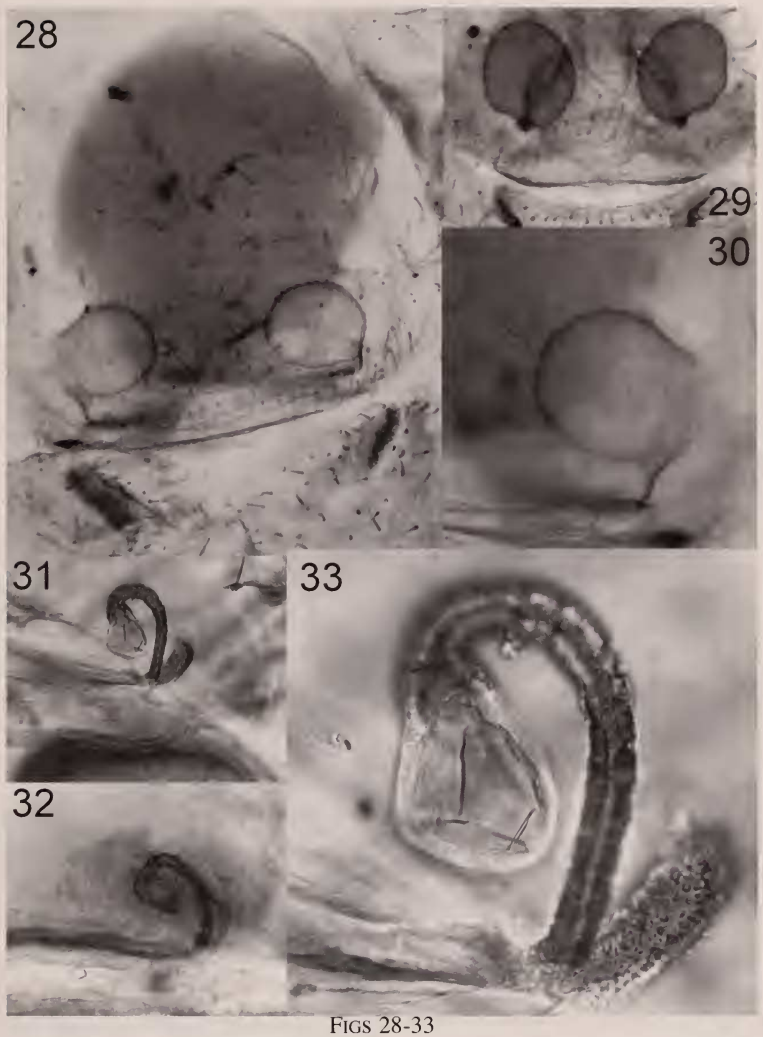






FIGS 21-27

(21-22) *Dictis* sp. A. (23-24) *Dictis* sp. B. (25-26) *Dictis* sp. C. (27) *Scytodes mawphlongensis*. (21, 23, 25) Habitus of female, dorsal view. (22, 24, 26) Right part of internal genitalia of females, dorsal view. (27) Left part of internal genitalia, dorsal view. Scale lines: 0.25 mm (21, 23, 25), 0.10 mm (27), 0.05 mm (22, 24, 26).



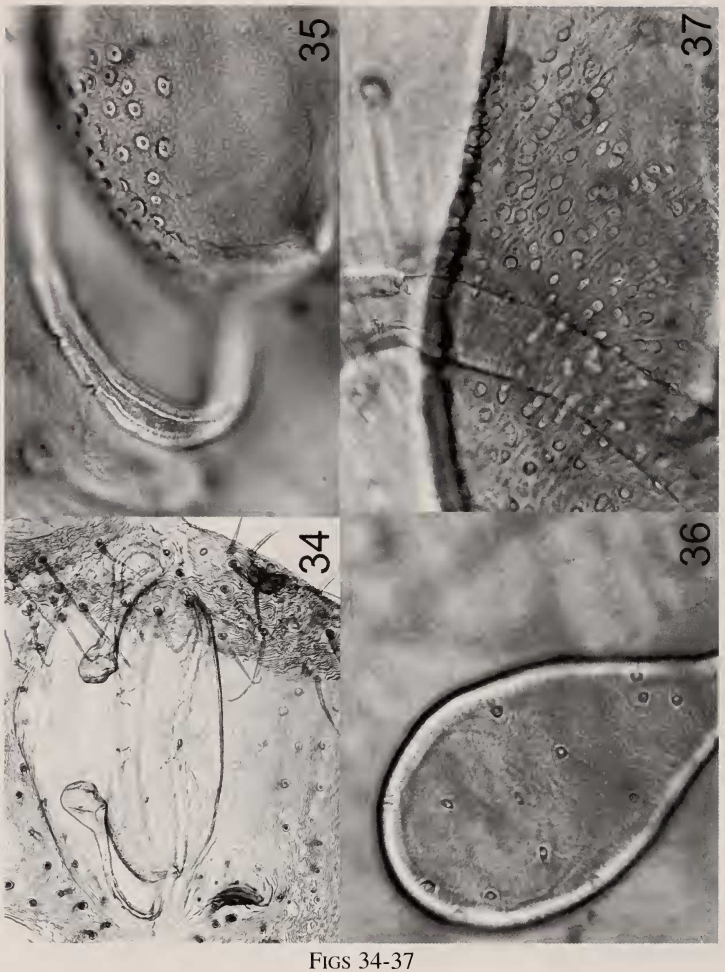
FIGS 28-33

(28-30) *Dictis thailandica* sp. n., paratypes from northeastern (28, 30) and southern Thailand (29). (31-33) *Scytodes fusca*. (28-29) Internal genitalia of females, dorsal view. (30-33) Right part of internal genitalia, dorsal view.

Female genitalia (Figs 27, 34-35). Epigastric furrow slightly excavated medially, without glandular pores. Atrium large, swollen anteriorly, its wall thin, entirely membranous, provided with numerous glandular pores anterolaterally. Posterior pouch absent. Receptacular stalk elongate, thick-walled, glandular pores presented in its anterior half.

NATURAL HISTORY: The specimens were collected by sifting decomposing organic material on the floor of a mixed deciduous dipterocarp forest along a stream.

DISTRIBUTION: India, Nepal, northern Thailand (new record).



FIGS 34-37

(34-35) *Scytodes mawphlongensis*. (36-37) *Dictis* sp. C. (34) Internal genitalia of females, dorsal view. (35) Detail of internal genitalia showing pores on receptacular stalk and atrium. (36-37) Pores on receptaculum (36) and atrium (37).

Group D

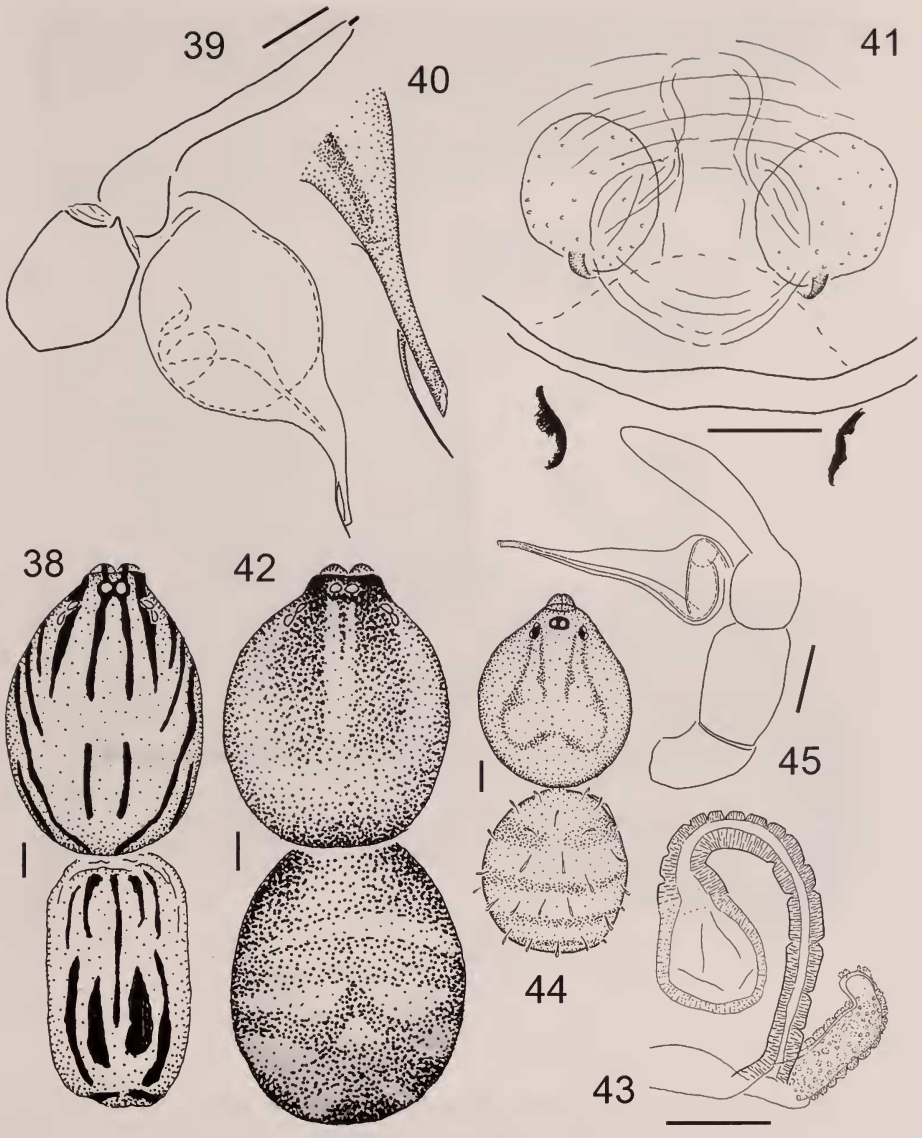
SPECIES INDLUDED: *Scytodes fusca*; an unnamed *Scytodes* species (to be placed in a new genus) from Sarawak (see Deeleman-Reinhold, 1989: 620, figs 1-3); *Scytodes* sp. A.

Scytodes fusca Walckenaer, 1837 Figs 31-33, 42-43, 56

Scytodes fusca Walckenaer, 1837: 272, description of ♂♀.

For a complete synonymy see Platnick (2009).

MATERIAL EXAMINED: Northern Thailand, Prae Province, Pha Nang Khoi, inside cave, about 200 m from entrance, 1♀, 19.vi.2006, leg. P. Dankittipakul [MHNG]. – Northern Thailand, Chiang Mai Province, Chiang Dao District, Chiang Dao Wildlife Research Station, 380 m, 1♀, 8.xi.2007, leg. P. Dankittipakul [MHNG].



FIGS 38-45

(38-41) *Dictis thailandica* sp. n., holotype (38-40) and paratype (41). (42-43) *Scytodes fusca*. (44-45) *Scytodes* sp. A. (38. 44) Habitus of male, dorsal view. (39, 45) Male palp, lateral view. (40) Tip of embolus. (41) Internal genitalia of females, dorsal view. (42) Habitus of female, dorsal view. (43) Right part of internal genitalia, dorsal view. Scale lines: 0.25 mm (38, 42, 44), 0.10 mm (39, 41, 43), 0.05 mm (45).

REMARKS: Numerous published synonyms of *S. fusca* are not based on a comparison of types and probably refer to different species. All available material known for *S. fusca* is currently revised by Lehtinen & Dankittipakul.

FIGS 46-51

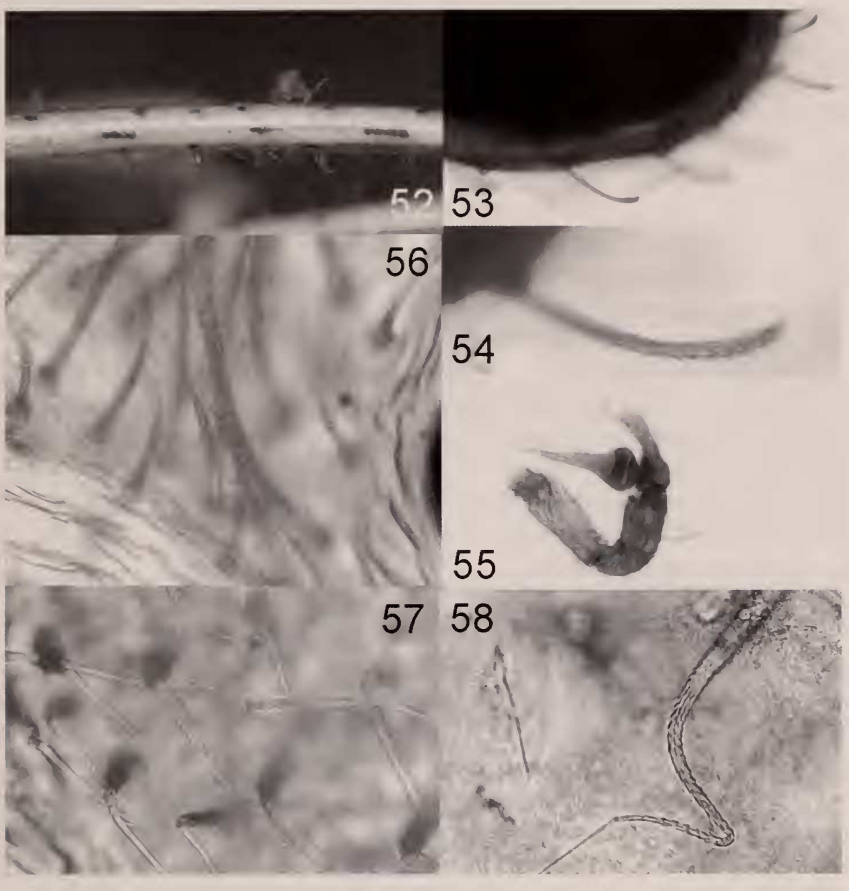
(46, 51) *Dictis elongata* sp. n., holotype. (47, 50) *D. denticulata* sp. n., holotype. (48-49) *D. thailandica* sp. n., holotype. (46-48) Male palp, lateral view. (49-51) Tip of embolus.

Females of *S. fusca* can be recognized by the peculiar vulva in which the tubular proximal part of the receptacular stalk has thick, heavily sclerotized and perforated walls whereas the receptacular head is membranous (Figs 31-33, 43).

DESCRIPTION

Female: Pattern and coloration (Fig. 42). Prosoma strongly convex posteriorly. Carapace dark brownish, with a faint yellowish band running medio-longitudinally behind AME. Opisthosoma globular, dorsum pale yellowish, anteriorly with broad transverse brownish band followed by a series of thinner chevrons. Genital region covered with modified elongate hairs (Fig. 56).

Female genitalia (Figs 31-33, 43). Epigastric furrow slightly excavated medially, with glandular pores. Atrium indistinct, connected directly to small, thick-walled,



FIGS 52-58

(52) *Dictis denticulata* sp. n., holotype. (53-55) *Scytodes* sp. A. (56). *S. fusca*. (57-58) *S. mawphlongensis*. (52) Tibia I of male (lateral view) showing proventral row of denticles. (53) Club-shaped bristles on opisthosoma. (54) Ditto, enlarged. (55). Male palp, lateral view. (57-58) Spigot-like bristles on epigastric furrow of male.

heavily perforated digitiform structure. Posterior pouch absent. Receptaculum long, its stalk thick-walled, heavily sclerotized, numerous glandular pores presented along its anterior half; anteriorly forming a spherical membranous sac.

NATURAL HISTORY: The specimens were collected from irregular webs on the walls of a cave and on the outside of a bungalow.

DISTRIBUTION: Pantropical; this is the first record for Thailand.

***Scytodes* sp. A** Figs 44-45, 53-55

MATERIAL EXAMINED: Southern Thailand, Nakhorn Sri Thammarat Province, Khao Nan National Park, sifting in a semi-evergreen lowland forest, 2♂, 3 juveniles, 12.ii.2006, leg. P. Dankittipakul [MHNG].

Remarks: The general conformation of the palps of the two males examined corresponds well with illustrations of the male palp of *S. fusca* and related species in which the bulb is tapering towards its apex (Figs 45, 55). However, there are significant differences between these males and those of *S. fusca*. In the latter, the base of the embolic part is abruptly narrowing to form an elongate slender embolus which is subapically bent ventrad (see Brignoli, 1976: fig. 110; Brescovit & Rheims, 2000: figs 5-6) while in the males examined here the male bulb gradually narrows towards the apex of the embolus without a clear border between bulb and embolic base. Judging from palpal morphology, the males examined closely resemble those of *S. longipes* by having a relatively wide embolic base which is gradually narrowing towards the embolic apex. Nevertheless, the males examined clearly exhibit some somatic features that distinguish them from those of *S. longipes*: the body size is rather small and their legs are not noticeably elongate; furthermore, the dorsum of the opisthosoma is sparsely clothed with modified club-shaped bristles situated on slightly elevated sockets. Such hairs are not present in *S. longipes*. The examination of conspecific females would be crucial to corroborate and confirm these differences as species-specific. Therefore the specimens examined here are informally described as a *Scytodes* species without naming it.

Description

Male: Pattern and coloration (Fig. 44). Prosoma strongly convex, in profile highest in the middle. Carapace pale, whitish, with faint reddish markings. Legs slender, whitish, without marking. Opisthosoma globular, whitish; pattern on dorsum of opisthosoma: anteriorly with large, medially disconnected blotches of reddish brown, followed by small, thinner transverse bands.

Male palp (Figs 45, 55). Palpal femur cylindrical, almost as long as wide. Cymbium with three spiniform distal setae. Bulb basally rounded, gradually narrowing towards apex of embolus.

Natural history: The specimens were collected by sifting dead leaves and decomposing organic matter in a lowland rainforest along a stream.

Distribution: Only known from one locality in southern Thailand.

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